

MANLOVE LAKE  
Fayette County  
2006 Fish Management Report

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2008

## EXECUTIVE SUMMARY

- Manlove Lake is a 15-acre impoundment located in Fayette County approximately 6 mi northwest of Connersville, Indiana. Anglers can access the lake from the shoreline or by launching a boat. There is a daily launch fee required or there is an annual permit available for boating anglers who frequent the lake.
- A fishery survey was conducted July 18 and 19, 2006. The predominant species collected by number were bluegill (75%) and largemouth bass (21%).
- A total of 193 bluegill was collected that weighed 13 lbs. Bluegill ranged in length from 2.0 to 8.5 in and averaged 4.3 in. Eleven percent of bluegill were available for harvest (6.0 or larger).
- There were 53 largemouth caught that ranged in length from 1.8 to 16.3 in and averaged 7.9 in. Bass caught weighed a total of 34 lbs. A total of 28% of the bass collected met or exceeded the 14-in minimum size limit.
- The most recent stocking of channel catfish (500, 8 in fish) occurred in the fall of 2006. The next stocking of channel catfish is slated for the fall of 2008.
- The implementation of grates to prevent the passage of large fish through the overflow at Manlove Lake allowed the conservation club to stock 60 triploid grass carp in the fall of 2006.
- The conservation club should apply for an aquatic vegetation control permit by the end of January. Herbicide treatments for submersed vegetation should continue to be listed on the permit application along with algae treatments. Contact District 5 fisheries biologists by the end of March to help develop a herbicide treatment plan.
- Continued control of filamentous algae should start as early as April and continue throughout the year.
- Anglers are encouraged to practice catch and release for largemouth bass to help control the bluegill population and any bluegill caught should be harvested.

## INTRODUCTION

Manlove Lake is a 15-acre impoundment located in Fayette County approximately 6 mi northwest of Connersville, Indiana. The lake and the park surrounding it are owned by the county and are leased by the Fayette County Conservation Club. Since 1971, the Division of Fish and Wildlife (DFW) has managed the fishery. Anglers can access the lake from the shoreline or by launching a boat. There is a daily launch fee required or there is an annual permit available for boating anglers who frequent the lake.

In the past, Manlove Lake's fishery has been dominated by an overabundance of small bluegill. This was primarily a result of overly abundant submersed vegetation. Therefore, management efforts have focused on trying to reduce the number of bluegill by encouraging increased bluegill harvest, promoting catch and release of largemouth bass, and asking the park to increase weed control efforts. Channel catfish have been stocked on a biennial basis to provide additional angling opportunities. Prior to this survey, the last stocking of catfish was in the fall of 2004.

The current survey was conducted to determine if recently employed management strategies have begun to correct the predator/prey balance. A primary focus was the amount of aquatic vegetation present and its impact on the fishery.

## METHODS

The survey was conducted July 18 and 19, 2006. Physical and chemical characteristics of the lake were measured and collected according to DFW survey guidelines (2001). Aquatic vegetation was sampled on July 19, 2006 according to DFW guidelines (2006).

Fish were collected via night DC electrofishing for 0.5 h using two dippers, two experimental-mesh gill net lifts, and one trap net lift. The collected fish were measured to the nearest 0.1 in TL. Weight estimates of all species were calculated using central Indiana averages or length-weight regressions. Proportional stock density (PSD) was calculated for bluegill and largemouth bass (Anderson and Neumann 1996). The Bluegill Fishing Potential Index (BGFP) was used to describe the bluegill fishery (Ball and Tousignant 1996).

## RESULTS

The surface temperature at Manlove Lake on July 18 was 84.2°F. The dissolved oxygen level dropped from 5 ppm at 4 ft to 0.1 ppm at 6 ft, indicating the thermocline was present between 4 and 6 ft of water. The Secchi disk reading was 3.0 ft.

Coontail, southern naiad, and thick mats of filamentous algae were all found at over half the sampling sites, with coontail being the dominant of the three. Overall, six species of submersed vegetation, algae, duckweed, cattails, and watermeal were collected or observed.

There were 257 fish collected that weighed 54 lbs. Six species comprised the sample. The predominant species collected by number were bluegill (75%) and largemouth bass (21%). The most abundant species by weight were largemouth bass (63%) and bluegill (23%).

A total of 193 bluegill was collected that weighed 13 lbs. Relative abundance of bluegill by number was 75% while abundance by weight was 23%. Bluegill CPUE was 310.0/h, 5.0/gill net lift, and 28.0/trap net lift. Bluegill ranged in length from 2.0 to 8.5 in and averaged 4.3 in. Eleven percent of bluegill were available for harvest (6.0 in or larger). Only 2% of bluegill collected were 8.0 in or larger. Age-2 bluegill averaged 4.1 in long and comprised 73% of the sample. Bluegill PSD was 10. The BGFP score was 16 which equates to a “fair” rating for the bluegill fishery.

Largemouth bass ranked second in abundance by number (21%), and first in abundance by weight (63%). There were 53 largemouth collected weighing 34 lbs. Bass ranged in length from 1.8 to 16.3 in and averaged 7.9 in. Bass electrofishing CPUE was 92.0/h. Largemouth bass PSD was 78. Nearly 47% of bass collected were 1.5 to 2.5 in and likely YOY. A total of 28% of the bass collected met or exceeded the 14-in minimum size limit.

Other fish collected were six black crappie, two channel catfish, two redear sunfish, and one black bullhead. Altogether, these species comprised 4% of the sample by number and 14% by weight.

## DISCUSSION

Bluegill continue to dominate the lake, comprising 75% of the fish community. As in the past, most of the bluegill collected (89%) measured less than 6 in. Dense vegetation growth has allowed large numbers of bluegill to survive by preventing bass from effectively preying on them. More competition among bluegill can lead to slower bluegill growth and an abundance of

small bluegill as in the case at Manlove. Abundant bluegill can also negatively affect the largemouth bass population by targeting bass eggs and hatched fry. This may be evident by the small number of age 1 and older largemouth caught during the survey.

Submersed vegetation must be reduced to improve the quality of the fishery at Manlove Lake. Normally, around 20% coverage of submersed vegetation is desirable. However, in the case of Manlove, this coverage needs to be no more than 10 to 15% to allow for optimum bass foraging on overabundant bluegill.

The implementation of grates to prevent the passage of large fish through the overflow at Manlove Lake allowed the conservation club to stock 60 triploid grass carp in the fall of 2006. The goal of the stocking was to reduce the amount of vegetation coverage rather than totally eliminate it. If in a few years it appears the grass carp are not providing enough reduction in submersed vegetation, additional grass carp can be stocked.

Thick mats of filamentous algae were observed during the survey. Grass carp do not prefer to feed on algae, thus they likely will not be able to control it as desired. Excessive algae, if not treated, could pose a serious threat to the fishery. Sometimes algae mats will die very suddenly, leading to a significant depletion of oxygen. This creates a very stressful environment for fish and could lead to a massive fish kill. Algae will need to be controlled from spring through late summer due to the high nutrient content in the lake. In order to keep the algae under control, treatments should begin as early as April and may be needed every 2 to 3 weeks to eliminate the need for large-scale treatments.

The conservation club should apply for an aquatic vegetation control permit by the end of January. While herbicide treatments for submersed vegetation may or may not be needed depending on the effectiveness of the grass carp, it is still recommended that they continue to be listed on the permit application along with algae treatments. If grass carp do not provide sufficient vegetation reduction around the pier or boat ramp, this will allow treatments to be conducted in these areas to improve access. The conservation club should contact District 5 fisheries biologists by the end of March to help develop a herbicide treatment plan.

Bluegill continue to provide the best angling opportunities at Manlove Lake. Though most of the bluegill are smaller than desired, their numbers are strong. Since bluegill are overly abundant, any bluegill caught should be harvested. With continued management efforts the bluegill fishery should start to improve. As in years past, anglers are encouraged to practice

catch and release of largemouth bass in order to increase the predatory pressure on bluegill once the aquatic vegetation is reduced.

The small number of catfish collected during the survey indicates these fish are being utilized by anglers. To maintain this fishing opportunity, channel catfish should continue to be stocked on a biennial basis because they typically are not able to sustain their populations in small lakes due to limited spawning habitat and heavy predation by bass on young catfish. The most recent stocking of channel catfish (500, 8 in fish) occurred in the fall of 2006. The next stocking of channel catfish is slated for the fall of 2008.

### RECOMMENDATIONS

- The conservation club should apply for an aquatic vegetation control permit by the end of January. Herbicide treatments for submersed vegetation should continue to be listed on the permit application along with algae treatments. Contact District 5 fisheries biologists by the end of March to help develop a herbicide treatment plan.
- Continued control of filamentous algae should start as early as April and continue throughout the year.
- Anglers are encouraged to practice catch and release for largemouth bass to help control the bluegill population and any bluegill caught should be harvested.
- Channel catfish should continue to be stocked on a biennial basis (500, 8 in fish).

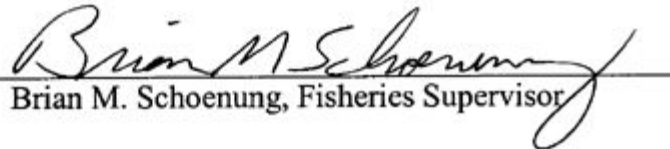
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- Ball, R.L. and J.N. Tousignant. 1996. The Development of an Objective Rating System to Assess Bluegill Fishing in Lakes and Ponds, Research Report. Indiana Department of Natural Resources. Indianapolis, Indiana. 18pp.
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Submitted by: Jamie L. Smyth, Assistant Fisheries Biologist  
Date: December 10, 2007

Approved by: J. Rhett Wisener, Fisheries Biologist

Approved by:   
Brian M. Schoenung, Fisheries Supervisor

Date: January 31, 2008

# LAKE SURVEY REPORT

Type of Survey	<input type="checkbox"/> Initial Survey	<input checked="" type="checkbox"/> Re-Survey
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Lake Name <b>Manlove Lake</b>	County <b>Fayette</b>	Date of survey (Month, day, year) <b>7/18-19/06</b>
Biologist's name <b>Jamie L. Smyth</b>		Date of approval (Month, day, year) <b>1/31/2008</b>

LOCATION		
Quadrangle Name <b>Connersville</b>	Range <b>12E</b>	Section <b>21, NW1/4, SW1/4</b>
Township Name <b>15N</b>	Nearest Town <b>6 miles NW of Connersville</b>	

ACCESSIBILITY					
State owned public access site		Privately owned public access site		Other access site <b>Owned by Fayette County</b>	
Surface acres <b>15</b>	Maximum depth <b>9.5 ft</b>	Average depth <b>5 ft</b>	Acre feet <b>48</b>	Water level <b>1,030 msl</b>	Extreme fluctuations <b>Minor</b>
Location of benchmark <b>BM 1040 - T15N, R12E, S20, NE1/4, NE1/4</b>					

INLETS		
Name <b>Unnamed intermittent</b>	Location <b>North end</b>	Origin <b>T15N, R12E, S17, SE1/4, SE1/4</b>

OUTLETS																
Name <b>Lick Creek</b>	Location <b>South end</b>															
Water level control																
POOL	ELEVATION (Feet MSL)	ACRES														
TOP OF DAM	1,033															
TOP OF FLOOD CONTROL POOL	1,030	15														
TOP OF CONSERVATION POOL	1,030	15														
TOP OF MINIMUM POOL	1,020															
STREAMBED	1,020															
<table border="1"> <tr> <th colspan="2">Bottom type</th> </tr> <tr> <td><input type="checkbox"/></td> <td>Boulder</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Gravel</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Sand</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Muck</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Clay</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Marl</td> </tr> </table>			Bottom type		<input type="checkbox"/>	Boulder	<input type="checkbox"/>	Gravel	<input checked="" type="checkbox"/>	Sand	<input checked="" type="checkbox"/>	Muck	<input checked="" type="checkbox"/>	Clay	<input type="checkbox"/>	Marl
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<input type="checkbox"/>	Marl															

Watershed use <b>Mostly agricultural with some residential.</b>
Development of shoreline <b>A campground is located at the northwest side of the lake. The remaining areas are undeveloped, woody, and grassy areas. Much of the shoreline is available for bank fishing.</b>
Previous surveys and investigations <b>Fisheries surveys in 1971, 1974, 1979, 1981, 1985, 1987, 1990, 1992, 1996, 1999, and 2003. Renovations in 1972 and 1977.</b>



SAMPLING EFFORT					
ELECTROFISHING	Day hours		Night hours		Total hours
			0.5		0.5
TRAP NETS	Number of traps		Number of Lifts		Total effort
	1		1		1 lift
GILL NETS	Number of nets		Number of Lifts		Total effort
	2		1		2 lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS					
Color			Turbidity		
Brown			3 Feet 0 Inches (SECCHI DISK)		
Alkalinity (ppm)*			pH		
Surface: 51.3 Bottom: 51.3			Surface: 9.5 Bottom: 9.0		
Conductivity:			Air temperature:		
Not measured			NA °F		
Water chemistry GPS coordinates:					
N			W		

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	84.2	6.6	36			72		
2	83.7	5.7	38			74		
4	82.8	5.0	40			76		
6	76.6	0.1	42			78		
8	70.8	0.1	44			80		
10			46			82		
12			48			84		
14			50			86		
16			52			88		
18			54			90		
20			56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS

\*ppm-parts per million



NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0	8	4.1	0.01	1	20.0				
2.5	10	5.2	0.01	1	20.5				
3.0	24	12.4	0.02	1,2	21.0				
3.5	47	24.4	0.03	2	21.5				
4.0	36	18.7	0.04	2	22.0				
4.5	22	11.4	0.06	2	22.5				
5.0	16	8.3	0.08	2,3	23.0				
5.5	8	4.1	0.11	2,3,4	23.5				
6.0	3	1.6	0.15	4	24.0				
6.5	7	3.6	0.20	3,4	24.5				
7.0	6	3.1	0.25	3,4	25.0				
7.5	2	1.0	0.31	4,7	25.5				
8.0	3	1.6	0.38	7,8	26.0				
8.5	1	0.5	0.47	7	TOTAL	193			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		310.0 /hr		GILL NET CATCH	5.0 /lift		TRAP NET CATCH	28.0 /lift	

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	3	5.7	0.01	not aged	19.5				
2.0	11	2.1	0.01	not aged	20.0				
2.5	11	2.1	0.01	not aged	20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0	1	1.9	0.05	1	23.0				
5.5					23.5				
6.0					24.0				
6.5	1	1.9	0.12	1	24.5				
7.0	1	1.9	0.15	1	25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	53			
9.0	2	3.8	0.33	2					
9.5	1	1.9	0.40	2					
10.0	1	1.9	0.46	2					
10.5									
11.0	1	1.9	0.63	2					
11.5									
12.0	1	1.9	0.82	3					
12.5	2	3.8	0.95	not aged					
13.0									
13.5	2	3.8	1.20	4					
14.0	1	1.9	1.38	5					
14.5	8	15.1	1.56	4,5,6					
15.0	2	3.8	1.74	5					
15.5	1	1.9	1.92	5					
16.0	3	5.7	2.15	not aged					
16.5									
17.0									
17.5									
18.0									
18.5									
ELECTROFISHING CATCH		92.0 /hr		GILL NET CATCH	3.0 /lift		TRAP NET CATCH	1.0 /lift	

Species Bluegill	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept= 0.8	2005	10	2.0-3.2	1.4							
	2004	23	3.0-5.5	1.4	2.8						
	2003	6	5.0-7.3	1.4	3.2	5.7					
	2002	9	5.9-7.6	1.3	2.7	4.3	5.7				
	2001	0									
	2000	0									
	1999	4	7.8-8.5	1.4	2.8	4.7	5.9	7.1	7.6	8	
	1998	1	8.3	1.4	2.9	4.7	5.8	7.1	7.6	8.1	8.3

Species Largemouth bass	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept=0.8	2005	3	5.0-7.1	3.4							
	2004	5	9.3-11.1	3.5	8.3						
	2003	1	12.3	3.5	7.4	11.2					
	2002	3	13.7-14.5	4.3	8.5	11.2	13.0				
	2001	8	13.5-15.6	4.0	8.2	11.5	13.0	14.6			
	2000	1	14.9	3.8	8.2	11.5	12.6	13.6	14.3		

Bluegill Age-length Key										
Length group (in)	Total # number	Sub- sample	Age							
			1	2	3	4	5	6	7	8
1.0										
1.5										
2.0	8	5	8							
2.5	10	4	10							
3.0	24	6	4	20						
3.5	47	4		47						
4.0	36	5		36						
4.5	22	4		22						
5.0	16	5		13	3					
5.5	8	3		3	3	3				
6.0	3	3				3				
6.5	7	4			2	5				
7.0	6	4			5	2				
7.5	2	2				1			1	
8.0	3	3							1	1
8.5	1	1							1	
Total	193	53	22	140	12	13	0	0	3	1

Largemouth bass Age-length Key								
Length group (in)	Total # number	Sub- sample	Age					
			1	2	3	4	5	6
1.0								
1.5	3							
2.0	11							
2.5	11							
3.0								
3.5								
4.0								
4.5								
5.0	1	1	1					
5.5								
6.0								
6.5	1	1	1					
7.0	1	1	1					
7.5								
8.0								
8.5								
9.0	2	2		2				
9.5	1	1		1				
10.0	1	1		1				
10.5								
11.0	1	1		1				
11.5								
12.0	1	1			1			
12.5	2							
13.0								
13.5	2	2				2		
14.0	1	1					1	
14.5	8	6				1	5	1
15.0	2	2					2	
15.5	1	1					1	
16.0	3							
Total	53	21	3	5	1	3	9	1

# Mean length at Capture

## Bluegill

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	22	2.7	0.13	0.08	2.5	2.8
2	140	4.1	0.39	0.05	4.0	4.2
3	12	6.3	0.79	0.25	5.8	6.8
4	13	6.6	0.35	0.16	6.2	6.9
5	0	0.0	0.00	0.00	0.0	0.0
6	0	0.0	0.00	0.00	0.0	0.0
7	3	8.3	0.25	0.29	7.7	8.8
8	1	8.3	NA	NA	NA	NA

## Largemouth bass

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	3	6.4	1.08	0.60	5.2	7.6
2	5	10.0	0.70	0.37	9.2	10.7
3	1	12.3	NA	NA	NA	NA
4	3	14.2	0.34	0.32	13.5	14.8
5	9	14.9	0.18	0.14	14.6	15.2
6	1	14.8	NA	NA	NA	NA



## Occurrence and Abundance of Submersed Aquatic Plants - Overall

<b>Lake:</b> Manlove Lake	<b>Secchi (ft):</b> 3	<b>SE Mean Species / Site:</b> 0.21
<b>Date:</b> 7/19/2006	<b>Littoral Sites w/Plants:</b> 27	<b>Mean Natives / Site:</b> 2.00
<b>Littoral Depth (ft):</b> 8.0	<b>Number of Species:</b> 5	<b>SE Mean Natives / Site:</b> 0.21
<b>Littoral Sites:</b>	<b>Max. Species / Site:</b> 4	<b>Species Diversity:</b> 0.71
<b>Total Sites:</b> 30	<b>Mean Species / Site:</b> 2.00	<b>Native Diversity:</b> 0.71

<b>Species</b>	<b>Frequency of Occurrence</b>	<b>Score Frequency</b>				<b>Dominance</b>
		<b>0</b>	<b>1</b>	<b>3</b>	<b>5</b>	
Coontail	73.3	26.7	30.0	36.7	6.7	34.7
Leafy pondweed	36.7	63.3	30.0	3.3	3.3	11.3
Southern naiad	66.7	33.3	43.3	10.0	13.3	28.0
Sago pondweed	6.7	93.3	6.7	0.0	0.0	1.3
Elodea	16.7	83.3	10.0	3.3	3.3	7.3
Filamentous algae	53.3					

Other species noted: Cattails, watermeal, duckweed, American pondweed.